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Policy options and actions for expediting progress in implementation: transport

Report of the Secretary-General

Summary

Transport and mobility are essential preconditions for sustainable development. Adequate transport infrastructure and affordable transport services are still widely lacking in many developing countries, in particular in rural areas. At the same time, increased urbanization and motorization have resulted in unprecedented congestion, wasteful energy use, increased motor vehicle emissions and deteriorating urban air quality in many cities in both industrialized and developing countries, with serious negative impacts on public health, living conditions and climate change. Appropriate policy interventions are needed to support the establishment of affordable, economically viable, socially acceptable and environmentally sound transport systems. Policy incentives and investments need to be targeted at improving and expanding integrated public transport systems, in particular within and between urban areas, and facilitating mobility in rural areas. Policies intended to enhance sustainability should seek to avoid or reduce unnecessary transport and travel where possible, encourage a shift towards high-efficiency and low-carbon modes of transport, and promote system-wide efficiency improvements. Integrated urban and rural transport planning, as well as supportive fiscal and regulatory policies, combined with the development of new technologies and greater international cooperation, are key factors for achieving a transport sector that meets the requirements of sustainable development.

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I. Introduction

1. At its eighteenth session, the review session of the implementation cycle 2010-2011, the Commission on Sustainable Development conducted a comprehensive assessment of progress achieved with regard to the thematic cluster that includes transport, chemicals, waste management, mining and the 10-year framework of programmes for sustainable consumption and production patterns, as described in Agenda 21, the Programme for the Further Implementation of Agenda 21 and the Plan of Implementation of the World Summit on Sustainable Development. The Commission identified constraints and obstacles, as well as new challenges and opportunities, with regard to advancing implementation in the thematic area of transport.

2. At its nineteenth session, the Commission will take decisions on policy options and practical measures to expedite implementation in the thematic areas of the cluster. The session will be preceded by an Intergovernmental Preparatory Meeting, which will be held from 28 February to 4 March 2011 to discuss policy options and possible actions to address constraints and obstacles identified at the eighteenth session.

3. The present report is a contribution to the discussions at the Intergovernmental Preparatory Meeting on policy options and practical actions to expedite progress in the transport sector. The report draws on substantive inputs and information provided by Governments, major groups and United Nations programmes and agencies, in particular the United Nations Centre for Regional Development, the United Nations Environment Programme (UNEP), the United Nations Human Settlements Programme, the World Health Organization (WHO) and the five regional commissions. The United Nations Conference on Trade and Development (UNCTAD), the United Nations Development Programme, the International Maritime Organization and the International Civil Aviation Organization also contributed assessments in their respective sectors.

4. The report also benefited from information and data provided in the reports recently released by the World Bank Group, the regional development banks, the International Transport Forum of the Organization for Economic Cooperation and Development and professional international transport sector associations, including the International Union of Railways, the International Road Transport Union, the International Air Transport Association, the International Freight Association, the International Organization of Motor Vehicle Manufacturers and the International Automobile Federation.

5. The report should be read in conjunction with the reports of the Secretary-General to the Commission on chemicals (E/CN.17/2011/5), waste management (E/CN.17/2011/6), mining (E/CN.17/2011/7) and the 10-year framework of programmes on sustainable consumption and production patterns (E/CN.17/2011/8), which will also be under consideration by the Commission at the Intergovernmental Preparatory Meeting. Additional background papers on selected transport policy issues and options and a compendium of good practices and country experiences have also been prepared by the Secretariat and can be accessed in electronic form at the website of the Commission (www.un.org/esa/dsd/csd/csd_csd19.shtml).

II. Policies for development of sustainable transport

6. Transport and mobility are essential preconditions for economic growth, social development and global trade. However, they are also often associated with significant environmental impacts, including atmospheric pollution; thus, they pose major challenges for the achievement of sustainable development.

Box 1
Key issues in transport and sustainable development at a glance

Rural transport	1 billion people in developing countries do not have access to an all-weather road
Transport and social responsibility	An estimated 75 per cent of maternal deaths could have been prevented through timely access to care related to childbirth
Urban transport	By 2025 more than half of the population in the developing world will be living in cities
Roads and highways	More than 60 per cent of the world's paved roads are in high-income countries
Road safety	Around 1.2 million people die each year in road accidents; 90 per cent of these deaths occur in the developing world
Railways	Between 2000 and 2005, global rail freight grew by 25 per cent and land passenger traffic grew by about 19 per cent
Shipping and ports	Maritime transport moves more than 90 per cent of world trade by volume
Air transport	Around 35 per cent of international trade by value is carried by air transport
Transport, logistics and facilitation	Trade-associated transport costs in landlocked and small island developing countries are much higher and the volume of trade is much lower than in coastal countries
Transport dependence on fossil fuels	Transport relies on oil and petroleum products for 95 per cent of the energy use
Air pollution	Transport is a significant contributor to local air pollution and associated public health impacts
Climate change	Transport is responsible for 23 per cent of global energy-related greenhouse gas emissions, and its contribution is increasing rapidly

Source: World Bank.

7. Economic activity, globalization, national and international trade and transport are closely interlinked. In spite of gradual gains in productivity and energy efficiency, global transport energy use is continuously growing at an average rate of between 2 per cent and 2.5 per cent per annum. The transport sector relies on oil and petroleum products for more than 95 per cent of its increasing energy needs. Owing to its continued high reliance on fossil fuels, the transport sector not only exacerbates economic vulnerability and trade imbalances, in particular among net oil importing countries, but also represents the sector with the fastest growth in greenhouse gas emissions owing to the rapid growth in motorized mobility.

8. As observed by the Commission at its review session in May 2010, implementing policies and taking action to enhance sustainability of transport is increasingly urgent. Policies and practical measures that achieve a decoupling of economic growth and expansion of transport activity and a gradual decarbonization of transport energy systems could make significant contributions to a greener and more sustainable transport economy.

9. Policies for enhancing sustainability should promote appropriate combinations of measures that can avoid or reduce unnecessary transport and travel where possible, encourage a shift towards highly efficient and low-carbon modes of transport, and promote system-wide efficiency improvements. In addition, voluntary initiatives and programmes to offset greenhouse gas emissions from transport can also contribute to a reduction of net environmental impacts.

10. All modes of transport and their efficient integration are important, including road, rail, maritime and air transport, as well as non-motorized transport such as walking and cycling. Multimodal systems can provide an array of options for passenger and freight transport and can enable developing countries to participate more fully in international trade as well as foster national and regional commerce.

A. Expanding access to sustainable transport

11. Basic transport infrastructure and services are still inadequate or lacking in many rural areas of developing countries, making it difficult for the rural poor, including women, young people and children, to receive basic social services such as those related to health and education, and for workers to access jobs. About 1 billion people live more than 2 kilometres from the nearest all-weather road. Inadequate rural transport infrastructure perpetuates poverty, constraining the marketing of agricultural produce and other income-generating opportunities, and thus hampers efforts to achieve internationally agreed development goals, including the Millennium Development Goals.

Box 2

Rural transport infrastructure for poverty eradication and sustainable development: the experience of India

In 2000, 30 per cent of the 855,042 villages in India (representing about 300 million people) were still without all-weather roads and lacked access to basic services and markets. Hence, the Government launched the Prime Minister's Rural Roads Programme "Pradhan Mantri Gram Sadak Yojana", implemented by the National Rural Roads Development Agency with domestic and international funding provided through the national central road fund. The target of the programme was to provide access through the construction of all-weather roads to all rural villages and communities inhabited by more than 500 persons (or by more than 250 persons in mountainous tribal regions). Under the programme, 375,000 km of rural all-weather roads were built and 372,000 km of existing rural roads were upgraded, benefiting a total of 178,000 villages. The programme resulted in the following achievements:

Poverty reduction:	According to a recent report, for every 1 million rupees spent on rural roads, 163 people were lifted out of poverty
Income rise:	Household incomes of those gaining access to roads rose by 50 to 100 per cent
Market prices:	Farmers received better prices for their products as they could access markets directly, cutting out intermediaries and reducing the spoilage of perishable products
Agricultural productivity:	Agricultural and animal husbandry practices were modernized; improved seeds, fertilizers and veterinary services became available; yields of paddy almost tripled from an average of 0.6 tons per acre to 1.7 tons per acre
Rural employment:	Access to jobs improved, new (micro) businesses started up, diversifying the rural economy
Capacity-building:	Training of local people (e.g. local contractors) enabled income rise and opened new job opportunities
Health:	Access to health facilities and services, medicines and supplies was facilitated
Education:	Access to education facilities was facilitated with a 10 per cent increase in the literacy rate; a reduction of the gender gap as it was easier for girls to attend school; and improved availability of teachers
Social impacts:	Communities and individuals were empowered through mobility such as increased networking and family visits

Source: Indian Prime Minister's Rural Roads Programme and World Bank.

12. Greater investment in integrated rural development programmes, including providing adequate access to all-weather roads, contributes to poverty reduction, thus paving the way for achieving the Millennium Development Goals related to poverty by 2015. As appropriate, national sustainable development strategies and plans should include construction and improvement of rural roads to be designed and constructed with the active participation and involvement of the communities concerned. In this endeavour, the local communities should be supported with capacity-building, technical support and financial assistance from both domestic and international sources. The particular needs of least developed and landlocked developing countries, especially in sub-Saharan Africa, and of small island developing States, require urgent attention.

B. Promoting urban public transport for sustainable development

13. Transport poses great challenges in many of the rapidly growing metropolitan and other urban areas of developing countries, where lack of adequate planning and poor public transport services result in economic losses as a result of traffic congestion, high consumption of fuels and air pollution, with associated negative impacts on public health.

14. The WHO Healthy Cities Air Management Information System indicates that many cities suffer from poor urban air quality, with particulates, nitrogen oxides and sulphur oxides at times exceeding recommended maximum levels by a factor of up to four. Figures 1 and 2 provide a comparative overview on local air pollution in selected cities.

Figure 1
Particulate matter in OECD industrialized cities (micrograms per cubic metre, 2006)

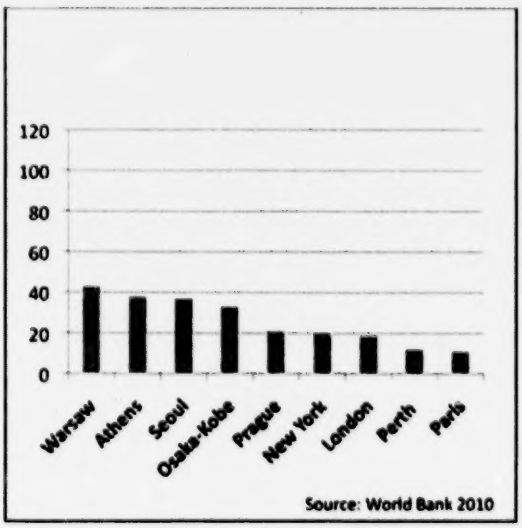
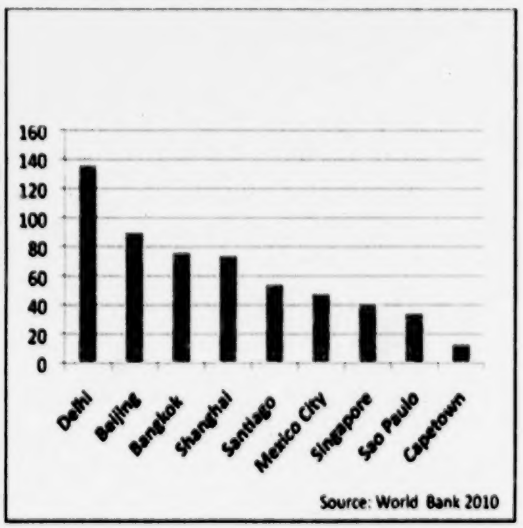


Figure 2
Particulate matter in developing countries (micrograms per cubic metre, 2006)



15. Comprehensive, coherent and effective transport policies and measures are urgently needed to address the growing challenges of urban transport. Policies will need to comprise a package of measures, including: (a) improvement and expansion of urban public transport systems that are more affordable, safe, clean, reliable, time-saving and environmentally sound; (b) facilitation and encouragement of non-motorized transport modes in urban centres, including greater use of walking and cycling for short-distance trips in good weather; (c) coherent regulatory measures on the use of private motor vehicles and on commercial urban transport service providers, such as operators of small buses, vans, taxis, three-wheelers and pedicabs; and (d) integration of transport considerations in urban development planning in order to ensure more sustainable urban transport systems in the future by reducing the need for travel and the intra-urban travel distance in cities that are yet to be built.

16. In many cities in developing countries, city administrations have recognized the advantages of bus rapid transit systems. A total of 152 cities already have such systems, which are characterized by buses that run on segregated lanes parallel to local traffic. In comparison with light rail transit or subway systems, bus rapid transit systems are much less capital intensive, while still achieving high transport efficiency. Enhanced bus rapid transit systems offer climate-controlled buses with platform-level entry, pre- or post-travel payment of fares and global positioning systems to inform customers of expected waiting times and transfer connections. Modern bus rapid transit systems can accommodate up to 10 times more passengers than mixed traffic.

17. Bus rapid transit and other urban public transport systems offer many direct and indirect local, national and global benefits. A recent study for Mexico City which estimated and monetized bus rapid transit system costs and benefits, demonstrated that the sum of public benefits, including economic time saved, avoided health problems, and fuel costs, by far exceed the costs of the system. In addition, bus rapid transit and other public transport infrastructure investments help to avoid significant amounts of greenhouse gas emissions. Several initiatives, including the Partnership on Low Carbon Sustainable Transport, and studies have been launched recently to explore the eventual inclusion of bus rapid transit and other public transport projects as nationally appropriate mitigation actions in a future climate change agreement and emission trading system.

18. While the costs of individual buses and bus rapid transit systems are moderate, many more systems are urgently needed to tackle the growing urban transport problems in developing countries and in cities that do not have such systems in place. For many developing countries, bus rapid transit systems would be affordable only with external technical assistance and financial support. International financial institutions could play a greater role in supporting urban bus rapid transit systems in developing countries. These systems can also offer a low-cost solution to urban traffic congestion in industrialized countries.

19. A growing number of developing country cities have also invested in underground or elevated urban light-rail, metro and commuter rail systems, in spite of their high initial investment costs. New systems with a few trunk lines can greatly benefit from feeder buses and unified fare systems to increase the number of passengers during the start-up phase. Due to high construction costs and private financing, metro tariffs are still rather high in many cities.

20. Experience has shown that the private sector and public-private partnerships can play an important role in financing and managing urban public transport systems. At the same time, the promotion of public transport can only be successful if fares remain affordable, including for the urban poor. This implies that public transport operators may have to be remunerated for the public health, socio-economic and environmental benefits they generate.

21. Area licensing, road pricing and parking charge schemes, such as those applied in Singapore, London and Paris, have proved to be effective in reducing urban vehicular traffic. Some cities, in particular those where air pollution poses a major threat to human health, have implemented temporary restrictions on the use of cars (e.g., by day of the week, number plate or minimum occupancy). Car-free days or temporary road closures for biking, walking or street markets have also become increasingly popular.

22. While passenger vans and taxis can contribute to congestion on main routes, they provide important and useful feeder services to mass transit systems and should be well integrated into urban transport system planning. Taxis are the motor vehicles that move around the most in urban areas. In cities where urban air pollution is a serious concern, municipalities may consider reviewing van and taxi fleet licensing and management with a view to improving services, encouraging the modernization of vehicles and fleets, ensuring the most economical use of fuels, monitoring transport tariffs, controlling vehicle emissions and ensuring adequate but not excessive competition, particularly between public and private services.[1]

23. Encouraging walking and cycling within inner city centres and in urban areas requires adequate provision of segregated bicycle lanes, without which cycling may be unsafe. This should be supported by provision of sufficient bicycle parking facilities, and related regulations are also essential. A shift is needed in investment towards roads that also provides for infrastructure for non-motorized transport. A growing number of cities, including in developing countries, have introduced bicycle rental systems. Like short-term car rental and car-sharing, bicycle rental also enhances sustainable mobility.

24. Decisions on transport policies, infrastructure and services largely fall under the authority of city administrations, municipalities and other local authorities. Since 1990, the International Council for Local Environmental Initiatives has facilitated the exchange of experience among city administration and other local authorities, including in the area of sustainable transport. The C40 cities initiative, supported by the Clinton Climate Initiative, also recognizes the important role of cities in designing sustainable transport projects and in mitigating climate change.

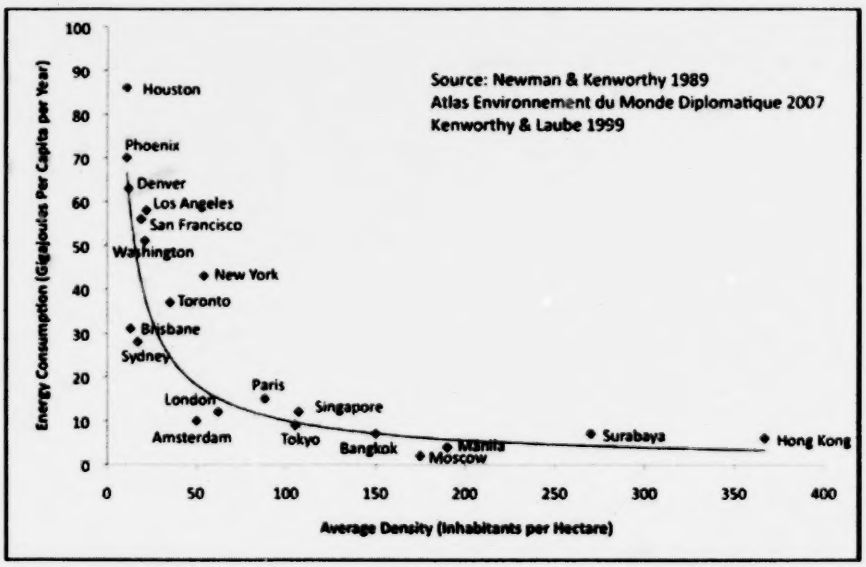
25. Comprehensive sustainability and transport considerations need to be fully integrated into urban planning and supported by the requisite policies and regulations. The integration of urban and transport planning is of particular importance considering the growing future challenges of urbanization. The world

[1] Policy options and practical experience in advancing sustainability in urban transport by modernizing and greening vans and taxi fleets will be the focus of an intersessional regional expert group meeting to be co-organized by the Transport Engineering Programme of the Alberto Luiz Coimbra Institute at the Federal University of Rio de Janeiro and the Department of Economic and Social Affairs of the Secretariat, to be held in Rio de Janeiro, Brazil, in April 2011.

population is projected to continue to increase, particularly in developing countries. At the same time, rural-to-urban migration is expected to continue in many developing countries. By 2025, one billion more people will need to be accommodated in existing and new cities. Appropriate urban development planning is, therefore, an imperative.

26. Urban public transport systems require a minimum population density and public transport demand to be economically viable. This can be achieved through appropriate land-use policies, mixed-use development and medium-to-high population densities along key corridors.

Figure 3
Urban density and transport related energy consumption



27. In figure 3, a clear relationship is seen between population density and per capita energy use for transport. The higher the population density of the urban population, the lower the per capita energy consumption for urban transport. In order to ensure sustainability in the longer term, city planners could aim at urban population densities in residential areas of more than 50 residents per hectare, in which case the per capita annual energy consumption for urban transport can be expected to be below 20 gigajoules, assuming that good public transport services are available and at least 40 per cent of all trips are made by either non-motorized or public transport.

28. In order to implement more sustainable urban development policies, and apply effective low-energy urban transport models in practice, continued expert information exchange as well as capacity-building for the assessment and training of urban and transport planners in developing countries will be essential.

C. Enhancing modal shifts

29. The projected continued growth of population and economic activity will lead to significant future increases in mobility and transport demand, particularly in developing countries. Therefore, the long-term sustainability of transport systems will require coordinated efforts to systematically enhance modal shifts, both from private to public transport and from energy intensive to low carbon modes of transport.

Figure 4
Freight transport CO_2 emissions (100 tons cargo, Basel-Rotterdam, 700 km)

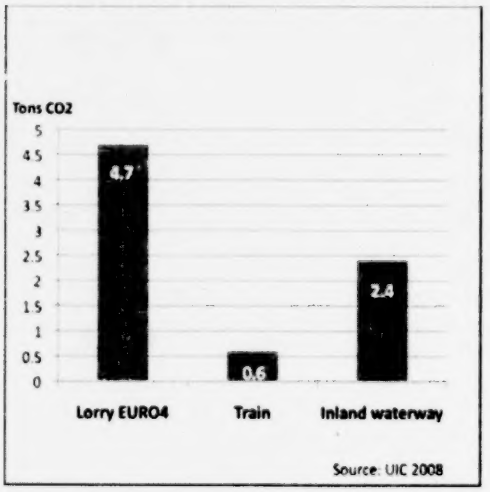
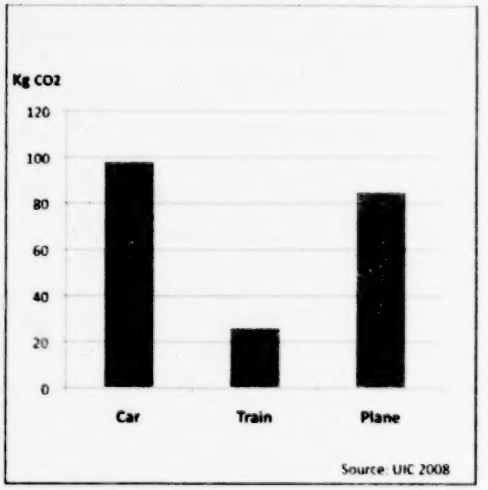


Figure 5
Passenger transport CO_2 emissions (1 person, Berlin-Frankfurt, 545 km)



30. In densely populated urban areas and city centres, and with the appropriate infrastructure and support, walking, cycling and public transport should become the preferred transport modes. For high-volume passenger and freight transport over long distances or between commercial centres and cities, railways and waterways often offer environmentally preferable transport options.

31. Where appropriate infrastructure and transport options exist, railways and waterways offer low-carbon options for passenger or freight transport. In Europe, travelling by rail is 3 to 10 times less CO_2 intensive than road or air transport. Whereas railways account for a transport market share of between 7 per cent and 10 per cent, the contribution of rail to European Union transport sector emissions is below 2 per cent. In addition and as a part of its sustainable development policies and programmes, the European Union rail sector has committed itself to reducing specific emissions from rail transport by 30 per cent over the period 1990-2020.

32. Anticipating continued growth in transport demand, railway authorities in Brazil, China and India and several other developing countries are investing in or planning the modernization and expansion of railway networks, including some very modern fast and high-speed train connections linking the centres of major cities.

Investments in the construction of new railways can be very costly, but can also offer very significant economic, social and environmental benefits in the long term. Opportunities for greater international and South-South cooperation in the construction of modern inter-city and high-speed train connections should be further explored, including for proposed cross-border rail links.

33. Where adequate waterway infrastructure and sufficient water flow is available, inland and coastal navigation can satisfy transport demand, often at comparatively low operating costs and transport prices. Increasing vessel dimension and the use of push barges and convoys makes inland and coastal shipping a cost-effective and comparatively sustainable transport option, in particular for moving bulk cargo or containers. However, stringent emission regulations are important to control air pollution from the combustion of heavy fuel oil, and the potential vulnerability of inland water transport to climate change needs to be carefully assessed.[2] In small island developing States, the transport infrastructure, notably harbours and coastal roads, is also vulnerable to potential natural disasters, such as tsunamis, and climate change.

D. Improving transport technologies and systems

34. Greater public and private investment in research and development on new low-carbon transport technologies and their transfer to developing countries is urgently needed.

35. Most countries that manufacture motor vehicles also regulate fuel quality, fuel economy and vehicle emissions. Whereas standards, regulations and test protocols differ among countries, the aims are common and include: (a) curbing the growing motor fuel consumption; (b) reducing energy import dependence; and (c) protecting urban air quality. Experience has shown that mandatory fuel economy standards and mandatory periodic motor vehicle inspections and emission testing can offer useful and effective tools for curbing growing fuel use and for improving urban air quality, provided that the applicable regulations are effectively implemented and enforced.

36. In May 2009, the President of the United States of America endorsed a new national policy aimed at both increasing fuel economy and reducing greenhouse gas emissions for all new cars and trucks sold in the United States. The new standards, covering model years 2012 to 2016, and ultimately requiring an average fuel economy standard of 35.5 miles per gallon (mpg) in 2016, are projected to save 1.8 billion barrels of oil over the life of the programme with a fuel economy gain averaging more than 5 per cent per year and a reduction of approximately 900 million metric tons of greenhouse gas emissions.

37. The Global Fuel Economy Initiative and the "50by50" challenge were launched with the participation of UNEP with the aim of promoting further research, discussion and action to improve fuel economy worldwide. The Initiative provides an important forum for policy dialogue that involves representatives of leading motor vehicle manufacturers. It also supports developing countries in establishing their own fuel economy policies.

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[2] For a detailed discussion of sustainable river transport, see P. Gernot, "Sustainable transport: a case study of Rhine navigation", *Natural Resources Forum*, Vol. 34, No. 4 (November 2010), pp. 236-254.

38. The Partnership for Clean Fuels and Vehicles of UNEP has successfully assisted many developing countries in reducing vehicular air pollution through the promotion of lead-free, low-sulphur fuels and cleaner vehicle standards and technologies. Enforcement of fuel quality standards and improvements can significantly reduce urban air pollution. In many developing countries and their cities, urban air quality is still frequently below the standards recommended by WHO.

39. Some developing countries import many used motor vehicles, sometimes even old ones which can be unsafe and inefficient. Regulating the trade in second-hand vehicles is an important policy option, in particular for developing countries.

40. Compressed natural gas offers a preferable alternative to diesel engines in urban traffic. It produces comparatively low emissions, including nitrogen oxide. Moreover, the natural gas engine is also appreciably quieter. Other factors in favour of commercial vehicles being equipped with natural gas engines are the 25 per cent lower well-to-wheel CO_2 emissions and the relative abundance of natural gas reserves. The comparatively low price of natural gas also reduces operating costs. In many countries, compressed natural gas is used in public buses, taxis and other commercial vehicles servicing urban areas.

41. Sustainably produced biofuels can also contribute to diversification of energy sources and supplies. Biofuels currently account for about 2 per cent of global fuel consumption for transport. A growing number of countries support domestic production of biodiesel and ethanol through subsidies, reduced taxes and regulations requiring mandatory blending of biofuels with petrol or diesel fuel. However, only a limited number of countries have favourable climatic conditions and the land and water resources necessary for large-scale biofuel production.

Box 3

Diversification of motor fuels: the ethanol programme of Brazil

For many years, the Government of Brazil has placed great emphasis on the promotion of renewable energy, including the production and use of biofuels. At present, there are some 325 plants in operation processing 425 million tons of sugarcane per year, half of which are used for ethanol production. Facilities produce sugar, ethanol and electricity from bagasse. Almost two thirds of the ethanol is being produced in the state of São Paulo, where most of the large plants are located. In 2006, approximately 17.8 billion litres of ethanol were produced, using 2.9 million hectares of land. In Brazil, the ethanol programme is replacing, at a very competitive price, approximately 40 per cent of the gasoline that would otherwise be used in the country's fleet of motor vehicles. The ethanol programme has made a significant contribution not only to local economic development and foreign exchange savings, but also to reducing Brazil's greenhouse gas emissions.

Sources: Rodrigo Augusto Rodrigues and José Honório Accarini, "Brazil's biodiesel program" (2008); and José Goldemberg, "The Brazilian biofuels industry" (2008).

42. In recent years, a growing number of motor vehicle manufacturers have announced plans or started production and sales of hybrid and plug-in electric vehicles, primarily for use in urban areas. In China, and in a growing number of other countries, electric bicycles have become popular. Electric vehicles are quiet, produce no emissions at the point of use and are, therefore, popular for use indoors (e.g. in hospitals, airports, exhibition halls and similar facilities) and in environmentally protected areas. Several motor vehicle manufacturers have also successfully tested and demonstrated hydrogen-based emission-free fuel-cell technologies.

43. When assessing greenhouse gas mitigation options, it is important to consider life cycle impacts. Electricity and hydrogen can offer important opportunities to decarbonize the transport energy system, but the realization of full-cycle carbon reduction depends on the way in which the electricity and hydrogen are produced. Greater use of electricity or hydrogen for private motor vehicles would be sustainable only if future systems are increasingly based on renewable sources of energy.

44. A gradual transition towards greater use of electric vehicles will also only advance sustainable development if the batteries necessary for on-board energy storage are affordable and if the growing quantities of lithium needed in these batteries are produced in a sustainable way.

45. The Senior Expert Group Meeting on Sustainable Development of Lithium Resources in Latin America: Emerging Issues and Opportunities, organized jointly by the Economic Commission for Latin America and the Caribbean and the Department of Economic and Social Affairs of the Secretariat in Santiago in November 2010, provided an opportunity for information exchange and comprehensive analysis of the various economic, social and environmental dimensions of lithium carbonate production. The meeting concluded that lithium can be extracted from salt flats and associated brines in a sustainable manner using a variety of technologies. There are potentially significant resources, in particular in the so-called "lithium triangle", which includes Chile, Argentina and the Plurinational State of Bolivia. The meeting concluded that no shortages in the global supply of lithium needed to be expected, but also called upon all countries producing lithium-ion batteries to plan and initiate appropriate recycling systems and related legislation in a timely manner.

46. Innovations to make transport safer, faster, more affordable and more environmentally benign are urgently needed. New information technologies, such as global positioning and intelligent transportation systems, including "smart highway" systems, provide many opportunities to facilitate traffic flows, reduce pollution levels and increase transport safety. More incentives should be provided to stimulate indigenous innovations in developing countries.

47. Clean fuel, alternative vehicle and advanced information technologies are available mostly in industrialized countries. In most developing countries, no or only limited capital is available to finance the necessary research and technology development. Much greater sharing and transfer of cleaner transport technologies to developing countries will be needed if sustainable transport systems for all are to be realized.

E. Improving transport safety

48. Safety is an important dimension of sustainable transport. Every year, 1.2 million people are killed and an additional 50 million people are injured as a result of road crashes, with about 90 per cent of such accidents taking place in low- and middle-income countries. According to WHO, it is estimated that annual economic losses related to road traffic injuries amount to some $518 billion and cost Governments between 1 and 3 per cent of the gross national product. Unless immediate measures are taken, road accidents are predicted to become the fifth leading global cause of death by 2030.

49. At its sixty-fourth session, the General Assembly adopted resolution 64/255 on improving global road safety, in which it welcomed the declaration adopted at the first Global Ministerial Conference on Road Safety, held in Moscow on 19 and 20 November 2009, and proclaimed the period 2011-2020 as the Decade of Action for Road Safety. All Member States were invited to define their own national road traffic casualty reduction targets, formulate national strategies and implement the corresponding regulatory initiatives, including regulations on seat belts, child restraints, helmets, drunk-driving and speeding. Vehicle and driver registration, training and inspections are all fundamental to road safety.

III. Strengthening the enabling environment for implementation

A. Enhancing investment in transport infrastructure and services

50. Continuing globalization and increasing trade will require enhanced investment in transport infrastructure, facilities and services if they are to become sustainable. Most public transport infrastructure and its maintenance and expansion are financed by the budgets of national, provincial and local governments and by the private sector. In addition to national development banks and transport development corporations, international financial institutions will also need to play an increasingly important role.

51. Conventional lending and project financing by the World Bank Group and the regional development banks has traditionally emphasized road transport infrastructure, which typically accounted for some 75 per cent or more of all transport project financing. In the fiscal year 2010, World Bank transport sector lending amounted to $9.4 billion, representing a 43 per cent increase over 2009. The World Bank Group has recently adopted a new transport financing strategy in which transport safety, urban transport systems and environmental and social concerns are projected to play a greater role. At present, the World Bank supports more than 200 transport projects in developing countries with a total net commitment of over $34 billion, representing 21 per cent of the Bank's project portfolio.

52. Carbon finance support for the transport sector is generally limited in scale. There are considerable methodological difficulties in determining and measuring the mitigation potential of specific transport policies and projects. Furthermore, there is often a lack of the data required for measuring, reporting and verifying mitigation actions. Hence, only very limited carbon finance support has become available so far for sustainable transport, in spite of the fact that transport is the fastest growing source of greenhouse gas emissions. In addition, availability of financing from the

Global Environment Facility for transportation projects is very limited. Greater financial support is urgently needed to invest in sustainable low carbon transport in developing countries.

53. Many large transport infrastructure projects have recently been completed, and many are being implemented or planned, including roads and highways, railways, bridges and tunnels, sea and dry ports, airports, canals, waterways and pipelines. Comprehensive and inclusive technical and financial planning, including detailed social and environmental impact assessment studies, remain critical to ensure the long-term sustainability of such investments.

54. Planning sustainable transport systems, including long-distance cross-border transport corridors, requires well-coordinated multimodal integration. The construction or expansion of new ports or airports needs to be accompanied by the appropriate upgrading of transport infrastructure and services in the associated hinterland.

55. Transport technologies and trade flows change over time. With the rapid growth in air traffic, the capacities of inner-city airports are quickly becoming inadequate. With growing containerization, many inner-city harbours also do not have the space needed for expansion. However, the relocation of transport activities can offer attractive opportunities for urban redevelopment, for example by converting former piers and warehouses into residential, commercial or recreational zones and facilities.

56. Planning and construction of transport infrastructures need to anticipate potential long-term future changes. River transport, waterways, canals and harbours can be affected by changes in precipitation, droughts or floods, or sea-level rise. Appropriate and environmentally sustainable water management is thus essential.

57. Ninety per cent of world trade by volume is transported by ships. During the past two decades, the average size and capacity of new ships has continuously grown. Shipping is a relatively efficient mode of transport with comparatively low energy use and CO_2 emissions per unit of freight moved, but there remains a need to work to improve fuel quality. Several countries, including Panama, are currently investing in the expansion of transport infrastructure to facilitate global trade. When completed, the ongoing expansion of the Panama Canal will significantly facilitate the transit of ships, including very large vessels.

58. Receding polar ice may make new Arctic sea lanes navigable by commercial shipping, possibly cutting the distance between ports in north-east Asia and ports in northern or central Europe or on the North American east coast by up to 4,000 nautical miles. Further international collaborative study could facilitate an assessment of potential future benefits and the environmental safeguards required.

59. Travel for domestic and international tourism is a rapidly growing service industry creating employment and income opportunities. However, tourism is often associated with high energy consumption. With growing environmental awareness, eco-friendly forms of travel and leisure, including hiking, biking and boating, are becoming increasingly popular in a growing number of countries. This is particularly true in Europe, where public investment in the required infrastructure, including short- and long-distance hiking trails, bicycle paths and other recreational facilities, is relatively advanced. Agro- and eco-tourism can significantly contribute

to the economic revitalization of rural and peripheral areas, and thus contribute to sustainable development.

B. Enhancing policy coherence, integration and stakeholder participation

60. Most Governments have many options and tools to directly and indirectly influence business and consumer decision-making on transport and mobility. It is essential to ensure that these policies, including fiscal policies, such as taxation and subsidization, are implemented in a consistent and coherent manner.

61. Decision-making on transport sector investment is often decentralized with local, regional and national public sector and parastatal institutions taking charge of different elements of the transport system. Inter-institutional collaboration is essential to ensure cost-effective planning and rational investment, in particular in situations in which the institutional mandates, objectives and agendas vary.

62. A total of 22 Asian countries endorsed the Bangkok Declaration for 2020: Sustainable Transport Goals for 2010-2020, in August 2010, listing 20 actions oriented towards the coherent and comprehensive development of sustainable transport in the region, including improving access to goods and services, improving modal share of non-motorized transport, public transport, rail and boats, and reducing the energy and emission intensity of transport technologies.[3]

63. In the Economic Commission for Europe (ECE) region, the Transport, Health and Environment Pan-European Programme brings together Government representatives of the concerned ministries and other stakeholders. The workplan for the programme for the period 2009-2014 seeks to support national action and international cooperation to develop a platform to: (a) attract and support investments in environment- and health-friendly transport; (b) build capacity for better integration of transport, health and environment policies; (c) share and disseminate good practices; and (d) enhance monitoring and reporting mechanisms in implementation.

64. Many fiscal policy tools, including taxation and subsidies, can significantly influence costs and prices of fuels, transportation tariffs and vehicles and should, therefore, be applied in a very consistent and coherent manner that conforms to market requirements. It is essential to avoid situations in which the effects of one policy measure counteract the intended effects of another.

65. There is a perception that investments in and the maintenance of public transport, including urban public transport, require high subsidies, some of which may not always be justified. The public policy debate often disregards the fact that there are many large hidden subsidies benefiting private car users in urban areas.[4]

66. Public transport, notably public buses, often remain stigmatized as the "poor man's car". It is essential to ensure that urban public transport is safe, clean, fast, environmentally sound and affordable. Ideally, public transport tariffs should be

[3] Available from www.uncrd.or.jp.

[4] See International Council for Local Environmental Initiatives, "Hidden subsidies for urban car transportation: public funds for private transport" (Freiburg, Germany, ICLEI European Secretariat, 2005).

lower than the marginal costs of using private motor vehicles. Only where and when these conditions are met, can public transport be expected to become the preferred transport choice for all.

67. Transport policymaking tends to affect the interests of many stakeholders who may be in favour of or opposed to specific transport policies or projects. Transparent and inclusive participatory decision-making processes are essential to ensure that policies and project decisions are ultimately accepted and supported by the public. In situations in which the public clearly benefits from a public transport or infrastructure policy or project, individuals who suffer disadvantages should always be compensated in a fair and transparent manner.

C. Facilitating international trade and transport cooperation

68. The landlocked developing countries find themselves disadvantaged in their development because of inherent geographical difficulties that deprive them of direct access to seaborne trade — long distances from major international markets, cumbersome transit procedures, inadequate transport infrastructure, and dependence on infrastructure and the institutional quality of coastal transit countries. These challenges not only affect economic development and growth, but have major ramifications for the social and environmental aspects of development, including the achievement of the Millennium Development Goals.

69. The Almaty Programme of Action: Addressing the Special Needs of Landlocked Developing Countries within a New Global Framework for Transit Transport Cooperation for Landlocked and Transit Developing Countries, adopted in 2003, has the overarching goal of forging partnerships to overcome the special problems of landlocked developing countries. The Programme recognizes the direct link between transport, international trade and economic growth on the one hand, and the achievement of the Millennium Development Goals on the other. It aims at ensuring fuller and more effective integration of the landlocked developing countries into the global economy through the implementation of specific actions to be undertaken by all relevant stakeholders in five priority areas, namely: (a) fundamental transit policy issues; (b) infrastructure development and maintenance; (c) international trade and trade facilitation; (d) international support measures; and (e) implementation and review.

70. In accordance with the provisions of the relevant General Assembly resolutions, including resolution 64/214, developments affecting transit and land transport to and from the 30 landlocked developing countries in Africa, Asia and Latin America is being periodically reviewed by the Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States and the secretariat of UNCTAD. Several recent studies have shown that many of the landlocked developing countries and their minimal manufactures exports were the most seriously affected by the recent global financial and economic crisis.

71. Small island developing States and their prospects for sustainable development are also often negatively affected by diseconomies of scale in trade and transport, leading to higher per unit transport costs, which in turn lead to low trade volumes. Low trade volumes often do not justify investment in technologies and transport infrastructure. In order to address these interrelated challenges, small island

developing States require immediate and substantial international support, including through retaining market access preferences for their exports, grants or concessionary financing for transport, information technologies and communication equipment, as well as assistance in accelerating the use of renewable energy, making tourism sustainable and tapping better the potential of island cultures.

72. Intergovernmental agreements on cross-border road and rail transport networks and the related trade facilitation agreements, such as those facilitated by the Economic and Social Commission for Asia and the Pacific, the Economic and Social Commission for Western Asia and ECE, have played an important role in enhancing sustainable development and cooperation at the regional level. Similar efforts have been proposed for intergovernmental and inter-agency collaboration in Africa with a view to elaborating and concluding an intergovernmental agreement on a trans-African highway.

73. After preparatory work carried out under the auspices of the United Nations Commission on International Trade Law, the Convention on Contracts for the International Carriage of Goods Wholly or Partly by Sea was adopted by the General Assembly in December 2008. The Convention, which requires 20 ratifications to enter into force, was opened for signature at a special signing conference held in Rotterdam, the Netherlands, in September 2009 and is known as the "Rotterdam Rules". Policymakers will need to consider the merits of the Convention and decide whether it complies with their expectations.

D. Promoting employment, development and sustained economic recovery

74. The transport sector employs millions of people worldwide. All transport related industries, including the automobile industry, as well as employment in these sectors, have been seriously affected by the global financial and economic crisis of 2009, which caused major decreases in global production and international trade and a steep decline in exports, first in the developed countries and then in the developing countries. As a result, many transport sector employees have lost their jobs and income. While Government interventions in the form of deficit spending for economic recovery and stimulus packages seem to have prevented the worst possible impacts in the short run, long-term impacts on the transport sector remain unknown.

75. Some economists suggest that further economic stimulus packages may be necessary to support a gradual global economic recovery process. For the enhancement of overall sustainable development, it is essential that a growing portion of stimulus funding be directed towards the development and deployment of public transport and greener transport technologies, rather than funding only conventional transport infrastructure projects that are ready to start physical implementation. Economic stimulus programmes should provide opportunities for creating new green jobs in the transport sector.[5]

[5] Organization for Economic Cooperation and Development (OECD), Meeting of the OECD Council at the Ministerial Level (Paris, 27-28 May 2010), *Interim Report of the Green Growth Strategy: Implementing our commitment for a sustainable future*.

E. Mainstreaming climate change considerations in transport policy formulation

76. The decoupling of transport services and energy use is important for mitigating climate change and improving efficiency. In light of the recent volatility in international energy prices, the development of alternative fuels, produced in a sustainable way, including compressed natural gas, ethanol and biodiesel, can offer diversification of transport fuels as part of an array of options for sustainable transport. There is also need to deploy cleaner fossil fuels.

77. Enhancing the modernization of transport technology and redefining the understanding of mobility, including thinking in terms of providing mobility services and promoting climate-friendly mobility management, can curb the projected growth in greenhouse gas emissions and support sustainable development.

78. ECE and its Inland Transport Committee have established the World Forum for Harmonization of Vehicle Regulations, which administers three important international agreements, adopted in 1958, 1997 and 1998, pertaining to uniform prescriptions for wheeled vehicles, equipment and parts, periodical technical inspections, and global technical regulations for wheeled vehicles. The World Forum and its six subsidiary Working Parties, on pollution and energy, general safety provisions, brakes and running gear, lighting and light-signalling, noise, and passive safety, are presently accelerating work to develop common global methodologies, test cycles and measurement methods for light vehicles, including CO_2 emissions. Most motor vehicle manufacturing countries, including such developing countries as Brazil, China, India, Malaysia, Mexico, South Africa and Thailand, actively participate in meetings of the Forum, which has a significant potential to contribute to a greening of the transport sector.

79. Voluntary programmes and measures to offset the carbon generated from transport activities by purchasing emission reduction units could effectively complement the avoid-shift-improve strategy towards sustainable transport. Private voluntary purchases of carbon credits can provide financing or co-financing for environmental conservation and greenhouse gas reduction projects, including in developing countries. Some 30 airline companies, many tour operators and a growing number of hotel chains offer carbon-neutral travel services. Efforts to promote sustainable tourism should in future routinely include carbon offsets.

80. Extrabudgetary support provided by donor countries has also enabled the United Nations to organize a number of conferences in a low-carbon or carbon-neutral manner, in particular conferences serviced by the secretariat of the United Nations Framework Convention on Climate Change and UNEP. The Commission may wish to consider a decision requesting the secretariat to arrange, whenever possible, for travel-related carbon emission offsets with regard to its future sessions.

IV. The way forward

81. Addressing the growing transport challenges is increasingly urgent. Transport infrastructure development often requires long lead times, visionary decision-making and thorough and integrated planning, as well as significant investment. At the same time, transport infrastructure is very durable and can provide services and

benefits for decades or even generations. Appropriate and effective policies and measures can facilitate and enhance transport and mobility for poverty eradication, a greener economy and a more sustainable future for all.

82. Essential economic, social and environmental considerations should always be systematically integrated into transport planning and decision-making, taking into account the three pillars of sustainable development. National and international policymaking and decision-making on transport should comply with and further the fundamental principles of sustainable development enshrined in the Rio Declaration on Environment and Development. Efforts to enhance sustainable transport and mobility should contribute to the implementation of the 10-year framework of programmes on sustainable consumption and production patterns.

83. Geographic disadvantages faced by many least developed countries, landlocked developing countries and small island developing States that constrain their participation in international trade and sustainable development owing to comparatively high transport costs, resulting from long distances, complicated logistics and small trade volumes, should be acknowledged in the relevant trade negotiations and technical cooperation agreements.

84. The challenges and opportunities differ significantly among countries, regions and cities. Therefore, there is also no feasible one-size-fits-all policy approach to solving transport challenges. However, accelerating progress towards a more sustainable transport future is both necessary and possible. To that end, the Commission may wish to consider developing an array of recommended policy options and practical measures for sustainable transport, including the following suggested elements and actions:

(a) Ensure access to adequate and affordable transport services in rural areas by providing the necessary transport infrastructure, including all-weather roads, in order to enhance achievement of the Millennium Development Goals;

(b) Significantly improve and increase public transport options in congested urban areas and city centres, including bus rapid transit, as well as metro and light rail systems, which should be safe, clean, efficient, affordable and environmentally friendly;

(c) Encourage the avoidance or reduction of unnecessary transport and travel;

(d) Facilitate walking and non-motorized transport in urban centres through appropriate planning and infrastructure;

(e) Accelerate a modal shift towards more economical, affordable and energy efficient modes of transport, including greater use of railways and inland waterways;

(f) Reduce local air pollution from the transport sector by improving fuel quality, vehicle emission standards and consumer information, and the modernization of taxi, truck, bus and other commercial fleets, as well as promoting non-motorized means of transport;

(g) Improve efficiency in fuel use by promoting lighter vehicle weight, aerodynamic designs, fuel-efficient tires, renewable energy and engine efficiency improvement;

(h) With a sense of urgency, significantly increase financial support and public and private investment from national and international sources for transport systems in developing countries, in particular in least developed countries, landlocked developing countries and small island developing States;

(i) Address the specific needs of women, young people, the elderly and the disabled, including safety and security, when designing transport systems;

(j) Enhance transport and road safety through active participation and contribution to the Decade of Action for Road Safety (2011-2020);

(k) Strengthen transport infrastructure and services by enhancing transport data collection and analysis and modern information technologies;

(l) Provide greater incentives for innovation, research and deployment of advanced transport technologies to achieve a greener, more energy and resource efficient economy and a sustainable low-carbon future;

(m) Facilitate international collaborative research, sharing of experience, capacity-building and technology transfer to make transport systems in developing countries more sustainable;

(n) Encourage voluntary initiatives and programmes to offset greenhouse gas emissions from transport to reduce its net environmental impacts.